

- Q. Does the contamination at Allied Landfill impact the city of Kalamazoo Well Field?
- A. No. EPA has studied the groundwater at Allied Landfill and the groundwater flow patterns in the area including the city well field and Allied Landfill. Based upon sampling data, the groundwater at Allied Landfill is not flowing towards the city well fields. In the horizontal plane, shallow groundwater at Allied Landfill flows east or northeast to Portage Creek and not Northwest to the city well-fields 3 and 7. In the vertical plane, groundwater generally flows up from the deeper aquifer, in which the city well-fields are located, to the shallow aquifer where Allied Landfill is located. Additionally, PCBs have not been detected, at levels that pose a risk, in the groundwater coming from Allied Landfill.
- Q. How has EPA cleaned up other landfills that are similar to Allied Landfill?
- A. King Highway Landfill, 12th Street Landfill and the Willow Boulevard/A-Site Landfill are PCB contaminated paper-waste landfills that are also parts of the larger Kalamazoo River Site. The cleanup remedy for all three of those landfills has been: consolidation, capping and long-term monitoring. There have only been X detections of PCBs in groundwater samples from King Highway (X years) Landfill. At 12th Street Landfill, groundwater monitoring has been ongoing since October 2011. There have been 224 samples collected and 13 detections, none of which were above the risk-based criteria. EPA has used consolidation, capping and monitoring as a cleanup method for dozens of landfills in Region 5. The types of engineered structures put in place as a part of the cleanup were responsive to the particular risks posed by the sites.
- Q. The consolidation and capping alternatives in the Feasibility Study do not include a bottom liner. Is it legal for a TSCA landfill to not have a bottom liner? Is it protective?
- A. It is not a legal requirement for all TSCA landfills to have a bottom liner. Regulations allow for a risk-based approach for closure of existing landfills which contain TSCA waste if it can be shown to be protective. Based upon the conditions at Allied Landfill, a bottom liner is not necessary for a remedy to be protective. The purpose of a bottom liner at a landfill is to prevent the risk of groundwater contamination by contaminants in a landfill. The groundwater data collected at Allied Landfill, show that PCBs are tightly bound to the residuals. The residuals have low permeability which reduces groundwater flow through the material, limiting the potential for leaching of contaminants. The consolidation and capping alternatives evaluated in the FS rely on capping to prevent infiltration of surface water through the residuals. As a result, a bottom liner is not necessary.
- Q. Will groundwater be diverted from bottom contact so there will be no treatment costs?
- A. Groundwater treatment is not expected to be required based on the properties of the residuals at Allied Landfill. Groundwater flow through the residuals will be limited due to the low permeability of the residuals. Permeability is a measure of how easily water can flow through a material. The permeability of the residuals has been measured in the range of 10^{-7} cm/second or less which is comparable to a clay liner for a landfill. In addition, PCBs do not readily dissolve into groundwater and have a high affinity for, or strong bond with, organic material. This is seen at Allied Landfill where the PCBs are bound up to the clay and wood fiber in the landfill and are

not dissolving into the groundwater. PCB concentrations in soil and residuals at Allied Landfill are generally low, but can be as great as 2500 mg/kg. In contrast PCB concentrations are only infrequently detected in groundwater. This is supported by the existing treatment system sampling data which only had 1 PCB detection in X years of operation with monthly sample collection. Because of these site conditions, it is not necessary to prevent contact between the bottom of the landfill and the groundwater.

- Q. Could the cost of a remedy at Allied Landfill impact the available funds for the river?
- A. If the remedy for Allied Landfill exceeds the amount in the trust set aside for Allied Landfill, it is possible that EPA might draw on site-wide funds (which could be used to fund cleanup on the Kalamazoo River).
- Q. Who will make sure that the landfill is protective long-term?
- A. It is EPA's responsibility to monitor the remedy and ensure that it is protective, both short-term and long-term. If EPA selects a waste-in-place remedy, there would be regular monitoring of the landfill cover and of the landfill groundwater. In a site-wide redevelopment scenario, an active presence at the site, would help ensure that the remedy stays effective in perpetuity.
- Q. Are there any alternative technologies that could be used to cleanup Allied Landfill?
- A. EPA has conducted a comprehensive study of alternative technologies, ranging from bio-remediation to incineration, and concluded that none of them provide a viable option at Allied Landfill. EPA's evaluation of the technologies can be found in Section 3 of the Allied Landfill Feasibility Study and a supplemental memorandum. Both of these documents can be found on EPA's webpage for Allied Landfill: <http://www.epa.gov/region5/cleanup/alliedpaper/index.html>
- Q. Would this new cleanup alternative that allows for site-wide redevelopment be protective?
- A. Yes. EPA can only select among cleanup alternatives that are protective.
- Q. What will be the cleanup standards for parts of the site?
- A. EPA has developed cleanup standards based exposure scenarios. EPA has identified the following exposure scenarios at Allied Landfill: residential, recreational, commercial/industrial, human angler and non-aquatic ecological. EPA discusses the cleanup standards in the Allied Landfill Feasibility Study which can be found on the webpage: <http://www.epa.gov/region5/cleanup/alliedpaper/index.html>
- Q. Would the addition of a new redevelopment alternative in the Feasibility Study mean that the total removal alternative would be taken out of the Feasibility Study?

A No. EPA will not be eliminating the total removal alternative from the Feasibility Study and will carry it forward through the remedy selection process.

Q. What are the costs associated with a remedy that keeps the waste in place?

A Remedies that leave waste in place require long-term maintenance to ensure that the remedy continues to be protective over time. For Allied Landfill, EPA has estimated that the net present value cost for ongoing maintenance of a consolidation, capping and long-term monitoring remedy to be 5 million dollars.

Q. What will be the effect of stacking the waste higher? Won't it cause contaminated water to be squeezed out sending contamination into the groundwater?

A Consolidation of excavated material onto existing material, to create the landfill, will result in additional pressure on and compression of those underlying materials. During the design, samples would be collected to determine if additional stabilization measures would be required for the underlying or the consolidated materials. When PCBs are present in groundwater, they are typically present bonded to very small particles called colloids. These colloids are expected to get captured in the soil matrix. However, groundwater monitoring would be performed to determine if PCBs were mobilized and groundwater treatment was required. In the long term, compression of the material could result in a lower permeability of the consolidated and underlying materials.